

CLAIMS

1. An electrical connector assembly comprising:
a plug having front and rear ends, the front end including a mating interface;
a receptacle having an opening configured to receive the mating interface of the plug;
a deflectable latch including a beam having a front end secured with the front end of the plug housing and a rear, free-standing end which is biasable towards the plug to permit the plug and receptacle to be mated with one another, the latch further including first and second latching projections extending from opposite sides of the beam; and
first and second latch mating elements formed within the receptacle opening, the first and second latch mating elements being positioned to securely engage the first and second latching projections when the plug and receptacle housings are fully mated with one another.
2. A connector assembly as set forth in claim 1, wherein the plug includes a cut out portion underlying the rear end of the latch beam for permitting increased inward deflection of the latch beam relative to the plug.
3. A connector assembly as set forth in claim 1, wherein the rear end of the latch beam includes a beveled inner face for permitting increased inward deflection of the latch beam relative to the plug.
4. A connector assembly as set forth in claim 1, wherein the first and second latching projections are longitudinally aligned with one another along the length of the latch beam.
5. A connector assembly as set forth in claim 1, wherein the plug includes a housing having a top wall, a bottom wall and first and second side walls, at least a portion of the top, bottom and side walls defining the mating interface, the latch being disposed along one of the first and second side walls, and wherein the overall height of the latch, as

measured between the outer edges of the first and second latching projections, is substantially the same as the height of the mating interface side walls.

6. A connector assembly as set forth in claim 5, further comprising:
 - a plug keying feature formed along the side wall of the plug housing opposite the latch; and
 - a receptacle keying feature formed within the receptacle opening for mating with the plug keying feature.
7. A connector assembly as set forth in claim 6, wherein the plug further comprises a terminal position assurance device (TPA) configured to mate with the plug housing, the TPA having a front wall and top and bottom opposed latching members extending from the front wall and being configured to engage with the mating interface for securing the TPA to the mating interface, one of the top and bottom latching members defining a second plug keying feature configured to mate with a second receptacle keying feature formed in the receptacle opening.
8. A connector assembly as set forth in claim 7, wherein the second plug keying feature comprises a longitudinal slot formed in one of the top and bottom latching members of the TPA.
9. A connector assembly as set forth in claim 8, further comprising first and second latching protrusions extending from the plug housing, the first latching protrusion being positioned to mate with the longitudinal slot to maintain the TPA in a preset position and the second latching protrusion being positioned to mate with the longitudinal slot to maintain the TPA in a fully engaged position.
10. An electrical connector system comprising:
 - a first plug having a mating interface;
 - a receptacle having an opening configured to receive the mating interface of the first plug housing;

a second plug having a mating interface sized to mate with the receptacle opening; a third plug having a mating interface which is smaller than the receptacle opening and therefore normally insertable into the receptacle opening;

first and second plug keying features formed on the mating interface of the first plug; and

first and second keying receptacle features formed within receptacle opening for mating with the first and second keying of the first plug, respectively, the first receptacle keying feature being configured to prevent the mating interface of the second plug from being fully inserted into the receptacle opening, and the second receptacle keying feature being configured to prevent the mating interface of the third plug from being fully inserted into the receptacle opening.

11. A connector assembly as set forth in claim 10,

wherein the first plug includes a housing having front and rear ends, the front end including a top wall, a bottom wall, and first and second side walls, at least a portion of the top, bottom, and side walls defining the mating interface of the first plug; and

wherein the connector assembly further comprises a deflectable latch formed along the first side wall of the first plug housing, the latch being adapted to engage with a reciprocal latching feature of the receptacle when the mating interface of the first plug is inserted into the receptacle opening; and

wherein one of the first and second plug keying features is formed on the second side wall of the first plug housing and the other of the first and second plug keying features is formed on one of the top and bottom walls of the first plug housing.

12. A connector assembly as set forth in claim 11, further comprising a terminal position assurance device (TPA) configured to mate with the front end of the first plug housing, the TPA having a front wall and top and bottom opposed latching members extending from the front wall and being configured to engage with the first plug housing for securing the TPA to the first plug housing, and wherein one of the first and second keying features comprises a longitudinal slot formed in one of the top and bottom latching members of the TPA.

13. A connector assembly as set forth in claim 12, wherein one of the first and second keying features is formed in the bottom latching member of the TPA, and wherein the bottom wall of the plug housing includes a longitudinally extending recess positioned to receive the bottom latching member of the TPA.

14. A connector assembly as set forth in claim 12, further comprising first and second latching protrusions extending from the first plug housing, the first latching protrusion being configured to mate with the longitudinal slot to maintain the TPA in a preset position and the second latching feature being configured to mate with the longitudinal slot to maintain the TPA in a fully engaged position.

15. A reduced envelope electrical connector housing assembly comprising:

- a first plug including a housing having a front and rear ends, the front end including a top wall, a bottom wall, and first and second side walls, at least a portion of the top, bottom, and side walls defining a mating interface;
- a receptacle having an opening configured to receive the mating interface of the plug housing;
- a second plug having a mating interface sized to mate with the receptacle opening;
- a third plug having a mating interface which is smaller than the receptacle opening and therefore normally insertable into the receptacle opening;
- a deflectable latch formed along the first side wall of the first plug housing;
- at least one latch mating element formed within the opening in the receptacle, the latch mating element being positioned to securely engage the latch when the first plug and the receptacle are fully mated with one another;
- a first plug keying feature formed on the second side wall of the first plug housing;
- a first receptacle keying feature formed within the receptacle opening for mating with the first plug keying feature when the mating interface of the first plug housing is inserted into the receptacle opening;

a second plug keying feature formed on one of the top and bottom walls of the first plug housing;

a second receptacle keying feature formed within the receptacle opening for mating with the second plug keying feature when the mating interface of the first plug is inserted into the receptacle opening; and

wherein one of the first and second receptacle keying features is configured to prevent the mating interface of the second plug from being fully inserted into the receptacle opening, and the other of the first and second receptacle keying features is configured to prevent the mating interface of the third plug from being fully inserted into the receptacle opening.

16. In an electrical connector system having a first plug having a mating interface, a receptacle having an opening configured to receive the mating interface of the first plug housing, a second plug having a mating interface sized to mate with the receptacle opening and a third plug having a mating interface which is smaller than the receptacle opening and therefore normally insertable into the receptacle opening, a method for preventing the second and third plugs from being mated with the receptacle, comprising:

providing first and second plug keying features on the first plug; and

providing first and second receptacle keying features on the receptacle for mating with the first and second keying of the first plug, respectively, the first receptacle keying feature being configured to prevent the mating interface of the second plug from being fully inserted into the receptacle opening, and the second receptacle keying feature being configured to prevent the mating interface of the third plug from being fully inserted into the receptacle opening.